

CLAIMS

1. A method of fabricating a package for an electronic device with low temperature co-fired ceramic (LTCC) including one or more multi-layer parts having multiple cavities therein for the location of active and passive electronic circuit components, comprising the steps of:

dividing and stacking a plurality of partially fabricated layers of LTCC material into a predetermined number of stacks, each of the stacks including a predetermined number of LTCC layers based on a respective cavity configuration to be subsequently formed therein;

separately laminating each of the stacks of LTCC layers at a first predetermined pressure into individual sections of laminated LTCC material;

forming desired cavity patterns into each of said sections;

stacking the sections including the cavity patterns formed therein into an assembly of contiguous sections;

placing the assembly in a lamination fixture; and

isostatically laminating the assembly of the sections at a second predetermined pressure into a composite LTCC structure.

2. A method according to claim 1 wherein said composite structure comprises a panel of a plurality of like LTCC parts.

3. A method according to claim 2 and additionally including the step of separating the panel into individual parts.

4. A method according to claim 3 wherein said individual parts comprise substrates for a circuit module utilized in an electronic system.

5. A method according to claim 1 wherein said layers of LTCC tape comprise at least 20 layers of about 5 mil thick tape.

6. A method according to claim 1 wherein said predetermined number of stacks of LTCC material include one stack for the fabrication of a ceramic ring frame and the remaining stacks are utilized for forming a substrate for a transmit/receive (T/R) module in a radar system.

7. A method according to claim 1 wherein said LTCC structure comprises at least one substrate for a transmit/receive (T/R) module for an active aperture of a phased array radar system.

8. A method according to claim 7 wherein one of said sections comprises an outer ceramic ring for the substrate.

9. A method according to claim 8 wherein said layers of LTCC materials comprise layers of LTCC tape.

10. A method according to claim 9 wherein said step of separately laminating each of the stacks comprises laminating the stacks of LTCC tape.

11. A method according to claim 10 wherein said first predetermined pressure ranges between about 1000 psi and about 2000 psi.

12. A method according to claim 9 wherein the step of forming the cavity patterns in each of said sections includes machining the cavity patterns in the sections.

13. A method according to claim 12 wherein the step of machining comprises routing the cavity patterns with a router tool.

14. A method according to claim 11 wherein said second predetermined pressure ranges between about 4000 psi and about 5000 psi.

15. A method according to claim 14 wherein said step of isostatically laminating the assembly includes isostatically laminating the assembly of contiguous sections at substantially 4000-5000 psi at about 72°C. for about 15 minutes.

16. A method according to claim 15 and additionally including the step of attaching a lid, a heat sink and a set of pin connectors to the substrate by brazing.

17. A method according to claim 2 and additionally including the step of firing the panel with a designated firing profile following the isostatic laminating step.

18. A method according to claim 16 wherein the pin connectors are attached by brazing metallization to a side wall surface of the substrate.

19. A method according to claim 18 and further including the step of dicing individual parts from the panel.

20. A method according to claim 18 and additionally including the step of effecting post fire printing as required.